





## Proposed New Guidelines for the Cleanup of Contaminated Sites in Ontario

The Ministry of Environment and Energy (MOEE) has prepared a document – *Guideline For the Cleanup of Contaminated Sites in Ontario* – that proposes new approaches on how sites in Ontario should be assessed for contamination and cleaned up. This proposed guideline is intended to replace the 1989 MOEE *Guidelines for the Decommissioning and Cleanup of Sites in Ontario* and the 1993 MOEE *Interim Guidelines for the Assessment and Management of Petroleum Contaminated Sites in Ontario*. Three other documents have also been drafted for public review and comment that provide supporting guidance and rationale in carrying out activities under the proposed guideline.

Environment and Energy Minister Bud Wildman has asked the Advisory Committee on Environmental Standards (ACES) to review the proposed guideline and companion documents and obtain public comment on them. This background paper has been developed as a general introduction to the proposed new guideline.

### THE NEED FOR CHANGE

On many urban and industrial properties, past or present site activities have left contamination that could affect human health and the environment. The nature, extent and the risk posed by these contaminants are generally not apparent unless site assessments are carried out to determine what problems there might be. Contaminated soils and groundwater can pose a concern to existing or future users of the property, its neighbors and the environment.

A new guideline is needed to address the limitations of the current 1989 cleanup guideline,

such as the lack of cleanup criteria and limited flexibility in dealing with contaminants at depth. A new approach is needed to encourage redevelopment and reuse of contaminated lands in an environmentally and economically sustainable manner.

### PROPOSED GUIDELINE

The proposed guideline will continue to describe a preferred practice for assessing and cleaning up contaminated sites. The new guideline essentially provides guidance to property owners/consultants on how to:

- assess a site for possible contamination;
- collect and analyse samples if contamination is suspected or found;
- clean up the property for re-use or development.

In most cases, the application of this guideline will be at the discretion of the property owner. There is no MOEE legislative or regulatory requirement to follow the new cleanup guideline unless the site is causing or is likely to cause an adverse effect (as defined in the Environmental Protection Act (EPA)). In this case, a cleanup may be ordered by MOEE under existing legislation.

The guideline and accompanying documents have been designed to assist property owners and their consultants in the assessment and cleanup of contaminated sites. The resulting reports are expected to become widely used by individuals and institutions such as lenders, insurers, and local governments when considering sites for development and re-use.

Under the guideline, a clean property is defined by soil, sediment, and groundwater cleanup criteria

developed for specific land and groundwater uses. If a property meets the cleanup criteria for a specific land and groundwater use, then that property is considered to be clean for the proposed use.

The guideline incorporates three different approaches for remediating a contaminated site. It is proposed that the property owner, not MOEE, have the option of selecting one of these cleanup approaches:

- Background
- Generic
- Site Specific Risk Assessment (SSRA)

#### **Background approach:**

The background approach remediates the site to rural or urban background levels for the contaminants of concern. A set of background soil criteria has been provided in the guideline that has been determined from an Ontario-wide sampling program in rural and urban parks not affected by local point sources of pollution (refer to section 7.3 of the guideline). Guidance is also provided on how to develop new background criteria when no MOEE background criteria exist.

#### **Generic approach:**

A new list of cleanup criteria (117 contaminants vs. 22 currently available) for both soil and groundwater is proposed for generic use at most contaminated sites. Separate criteria have been made available for surface (1.5m depth) and sub-surface (greater than 1.5m) soils.

These generic cleanup criteria are effects-based and have been set to protect human health and the natural environment at almost all sites. Some sites, because of their sensitivity or other conditions, may require the use of more stringent cleanup requirements. These sites are referred to as sensitive sites in the guideline and are discussed below.

Under the generic approach, there are two cleanup options available called Full Depth and Stratified Depth Cleanup.

A Full Depth cleanup involves remediating all contaminated soil on the property to meet the surface soil cleanup criteria.

A Stratified Depth cleanup applies surface soil criteria to a depth of 1.5m allowing soils below 1.5m to be remediated to separate sub-surface criteria. The Stratified Depth approach recognizes that sub-surface criteria do not in some cases need to be as stringent as surface criteria.

The selection of Full or Stratified Depth Cleanup criteria is also made on the basis of three land-use and two groundwater protection categories:

<u>Land-Use</u>	<u>Groundwater Protection</u>
* Agricultural	* Non-Potable (protects against vapour migration, contamination of surface waters)
* Residential/ Parkland	* Potable (above but added protection for drinking water use)
* Industrial/ Commercial	

The Non-Potable groundwater protection feature can only be provided when present or future drinking water supplies will not be adversely affected (refer to section 2.3.3 of the guideline).

Once the property owner/consultant determines the land and groundwater use for the site in accordance with the guideline, the selection of appropriate generic cleanup criteria is straightforward (refer to section 2.3 and figure 2.2 of the guideline).

The generic cleanup criteria for lead (Pb) in this guideline are based on the multi-media lead standards recently developed by MOEE that are currently under public review by ACES. Any comments received on the current public consultation on lead standards could affect the final cleanup criteria used in this guideline.

#### **Site Specific Risk Assessment approach:**

The new guideline proposes the allowance of both Site Specific Risk Assessment (SSRA) and Risk Management as alternatives to the use of MOEE generic or background cleanup criteria.

Risk Assessment is a scientific technique which estimates the risk posed to humans or the natural environment by the exposure to a contaminant at a known concentration. The principles of risk assessment were used extensively to develop the generic soil and groundwater cleanup criteria in the proposed guideline. In developing generic criteria, the likely contaminant exposures to humans/environment are conservatively estimated to enable the criteria to be used for most sites. For example, while a contaminated site with clay soils would not need the same level of ground water protection as a sandy soil site, to be protective for all sites, sandy soils were assumed in developing the generic criteria.

The development of site specific criteria using risk assessment is called Site Specific Risk Assessment (SSRA). Actual site information, such as soil type, is substituted for the assumptions used in the generic criteria. As a result, site specific cleanup criteria are usually numerically higher (less stringent) than the generic criteria, but should still protect human health and the environment.

The use of SSRA may provide cost savings for some site cleanups. The disadvantage of carrying out SSRA is that it can be an expensive undertaking relative to the value of the property or to the cleanup costs using generic criteria. SSRA can also be time consuming to research, develop, and review. Large contaminated sites are usually the most likely candidates for undertaking SSRA.

Risk Management techniques can also be incorporated after a SSRA is undertaken. Risk Management techniques are usually engineering solutions that manage or control contaminants (cap, isolate, ventilate/monitor), rather than undertaking steps to reduce or remove contaminants (treatment, destruction, or disposal).

The use of Risk Management (engineering solutions) raises two major issues, namely the monitoring and maintenance of the engineering solutions, and identifying responsibility/funding for these solutions in perpetuity.

In using SSRA and Risk Management to develop site specific approaches instead of remediating to generic or background criteria, a number of conditions for their use are proposed in the guideline, such as having the risk assessment peer-reviewed and carrying out a broad-based community consultation program (refer to section 7.4 of the guideline).

## SENSITIVE SITES

There may be situations where physical and chemical site characteristics are very different from the conditions and assumptions considered in developing the generic criteria. There may also be unique, highly sensitive receptors such as an endangered species, at or in the vicinity of a site, which have not been considered in the development of the generic criteria. When such sensitive site conditions exist, the generic criteria may be inappropriate for use.

In this case, the guideline proposes that additional investigation and consultation be carried out to determine if more stringent cleanup is required (refer to section 6.0 of the guideline).

## REVISED CLEANUP PROCESS

A four-step process is outlined in the guideline:

1. **Site Assessment** -- involves the systematic gathering of information to identify actual or potential contamination related to the current or historical use of the property.
2. **Sampling and Analysis** -- is intended to confirm and delineate the presence or absence of contamination found or suspected from the Site Assessment in Step 1.
3. **Site Cleanup** -- involves the development and implementation of a plan to clean up or remediate the contamination found on the property.
4. **Completion of the Cleanup** -- involves formal submission to MOEE of a Notice of Cleanup form.

The guideline provides a number of cleanup options available to property owners. Some of these options result in a need for information to be passed on to future owners and occupants to avoid future problems.

When a Stratified Depth cleanup is undertaken, the soils at depth should remain at depth. A site cleanup to Non-Potable soil and groundwater criteria results in groundwater quality that may not be suitable for human consumption. A cleanup based on SSRA may also have similar site use limitations. The knowledge of these site conditions should be passed onto future owners and occupants.

A notification mechanism is proposed for all cleanups where the site does not meet background or Full Depth/Potable groundwater protection criteria. A Director's Order (issued under Section 18 of the EPA) is proposed to direct property owners to register a Certificate of Prohibition on the title of the property (issued under Section 197 of the EPA). The Certificate of Prohibition and Director's Order provide a formal notification mechanism to persons acquiring a future interest in the property.

MOEE does not have the legislative authority to register all cleanup types on the title of the property without legislative changes to the EPA. Under the proposed guideline, the MOEE District Office would maintain a hard copy file of all Notices of Cleanup for the District.



## RESPONSIBILITY AND COMPLIANCE

For any contaminated site that is causing or is likely to cause adverse environmental effects, the MOEE will continue to take an active regulatory role in overseeing all aspects of the cleanup to ensure appropriate corrective action is taken.

It is proposed in the guideline that voluntary cleanups, where MOEE has no regulatory involvement, be implemented without a formal MOEE review of the cleanup plan. MOEE guidance would still be provided to a property owner/consultant on request for guidance on specific issues.

In both cases, the responsibility and liability for current and future cleanup remains with the property owner (present or past) and/or consultant.

Currently, there are no standard qualifications for environmental consultants in Ontario. In the absence of standard qualifications and accreditation for environmental consultants, it is proposed that final reports on the completion of cleanup, as well as the Notice of Cleanup document in this guideline be certified by a Professional Engineer licensed to practise in Ontario. It is also proposed that other established professional associations which demonstrate comparable self-regulation to MOEE be given the same recognition. MOEE will acknowledge the completion of cleanup only when the Notice of Cleanup is certified by such a professional; although other professionals may be involved in cleanup activities.

To ensure that cleanups are conducted in accordance with the guideline, as certified in the Notice of Cleanup, MOEE will be conducting spot audits, including sampling and analyses, to verify the cleanups performed.

## ECONOMIC ASSESSMENT OF PROPOSED GUIDELINE

An initial assessment of the economic implications of the proposed guideline has been prepared. A comparison of current costs and projected costs under the proposed guideline was made. This comparison focused on the use of the proposed generic cleanup criteria. The following observations were made:

- the proposed generic cleanup criteria will not unilaterally increase or decrease costs but will have a range of effects depending on the contaminant and cleanup options chosen.

- the combined use of the stratified depth cleanup and non-potable groundwater protection is likely to decrease the costs of cleanup in many urban areas where groundwater is not used or is not likely to be used for drinking water.

In addition it is expected that:

- the availability of more generic cleanup criteria will provide more certainty to property owners and lenders to estimate current/potential liabilities.
- the use of SSRA and risk management in lieu of generic cleanup criteria may provide some economic savings for the remediation of large contaminated properties.

## COMPANION DOCUMENTS

Three companion documents have been prepared to accompany the cleanup guideline.

*Guidance on Sampling and Analytical Methods For Site Clean-ups in Ontario* outlines the suggested methods for the sampling and analyses of air, soil, water, and sediments carried out in Step 2. Testing requirements for all 117 soil contaminants listed in the proposed guideline are not mandatory at each site. Property owners and their consultants should sample and analyse for those contaminants that are known or suspected to be present from the investigations carried out in Step 1 and 2.

*Guidance For the use of Risk Assessment in Site Clean-ups in Ontario* provides general guidance on how to carry out human health and ecological site specific risk assessments to develop site specific cleanup criteria.

A rationale document, which describes the basis for the development of the generic criteria, is also available for public review. This document is entitled *Rationale For the Development and Application of Generic Soil, Groundwater, and Sediment Criteria For Clean-up of Contaminated Sites: Part 1 - Discussion*.

NOTE: The *Proposed Policy For the Management of Excess Soil, Rock and Like Materials* is currently under review by MOEE. Public consultation on this proposed policy was previously undertaken by ACES and a final report was submitted to the Minister of Environment and Energy. As part of MOEE's current review, linkages between this policy and the proposed new cleanup guideline will be aligned.

## FOR FURTHER INFORMATION

To obtain *Guideline For the Clean-up of Contaminated Sites in Ontario* or companion and background documents related to this proposed guideline, please contact:

Advisory Committee on Environmental  
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## Companion Documents:

- (1) *Guidance on Sampling and Analytical Methods For Site Clean-ups in Ontario*
- (2) *Rationale For the Development and Application of Generic Soil, Groundwater, and Sediment Criteria For Clean-up of Contaminated Sites : Part 1 - Discussion*
- (3) *Guidance For the Use of Risk Assessment in Site Clean-ups in Ontario*

## Other Background Documents include:

- (1) *Economic Assessment of Case Studies Based on Proposed Ministry Clean Up Guidelines - June 1994*
- (2) *Rationale For the Development and Application of Generic Soil, Groundwater, and Sediment Criteria For Clean-up of Contaminated Sites : Part 2 - Appendices*







